Periodical WR

AMERICAN JOURNAL OF PHARMACY

and

THE SCIENCES SUPPORTING PUBLIC HEALTH

SINCE 1825

PUBLIC LIBRARY
JUL 16 1943
DETROIT

DR. J. LEON LASCOFF

1867–1943

In Memoriam

MAY
1943

NOW . . . . . .

more than ever are there opportunities

for

Men and Women IN SCIENCE

Greater than ever are the demands for men and women trained in Science. This Institution with its four accredited schools—Pharmacy, Chemistry, Bacteriology and Biology, offers coeducational, accelerated courses leading to the degree of Bachelor of Science. Write for a catalog, giving details of entrance requirements, fees, etc.

PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE

43rd Street, Kingsessing and Woodland Avenues

PHILADELPHIA 4, PENNSYLVANIA

Founded 1821

AMERICAN JOURNAL OF PHARMACY

AND THE SCIENCES SUPPORTING PUBLIC HEALTH

Since 1825

LINWOOD F. TICE, Ph. G., B. Sc., M. Sc., Editor
John E. Kramer, B. Sc., Business Manager

COMMITTEE ON PUBLICATION

E. Fullerton Cook, P. D., Ph. M., M. S., Chairman
Mitchell Bernstein, P. D., M. D., F. A. C. P. Louis Gershenfeld, P. D., Ph. M., D. Sc.
John K. Thum, Ph. G., Ph. M.
J. W. Sturmer, Phar. D., Ph. M., D. Sc., Secretary
Ivor Griffith, P. D., Ph. M., D. Sc., F. R. S. A., ex officio

Vol. 115. MAY, 1943 No. 5

CONTENTS

Our Cover:

J. Leon Lascoff—In Memoriam 156

Editorial:

Our Responsibility to "Our Boys" 157

Articles:

Effect of Introducing the Carboxyl Group Into the Phenol Molecule on Toxicity to Goldfish. By W. A. Gersdorff 159

Food in 1943. By T. Swann Harding 168

Medicine in the Confederate Army. By G. N. Malpass 173

Natives' Return. By Carter R. Bryan 178

Selected Abstracts 185

Solid Extracts 190

Book Review 192

Published monthly by the Philadelphia College of Pharmacy and Science
43rd Street, Kingsessing and Woodland Avenues, Philadelphia, Pa.

Annual Subscription, $3.00 Foreign Postage, 25 Cents Extra
Single Numbers, 30 Cents Back Numbers, 50 Cents

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa.
Under Act of March 3, 1879

Acceptance for Mailing at Special Rate of Postage Provided for in Section 1103
Act of October 3, 1917. Authorized February 15, 1920

OUR COVER

J. LEON LASCOFF

In Memoriam

THE passing of Dr. Lascoff from the scene of American Pharmacy leaves an emptiness that cannot be readily filled. His warm and sincere greeting was one of those things that his legion of friends anticipated and enjoyed and a meeting of organized pharmacy will indeed seem just a little less cordial without his friendly influence.

Dr. Lascoff came to the United States from Russia in 1892 and several years later he opened an apothecary shop that was to grow in public esteem and prestige until it ranked among the foremost in the country. His activities were not confined solely to this enterprise, however, and his service record in the interests of American Pharmacy is both lengthy and impressive. He served in many important capacities in the A. Ph. A. and was its President in 1936. For many years he was a member of the New York State Board of Pharmacy, he was a member of the Revision Committee of the United States Pharmacopœia and Prescription Editor of *Drug Topics.*

In 1937 Dr. Lascoff received the highest award in American Pharmacy, the Remington Medal.

Throughout his long life J. Leon Lascoff was a living example of what a pharmacist can and should be. His achievements are proof that the public wants and appreciates a pharmacist in whom they may have the same implicit confidence as that given their physician. American pharmacy could well wish for a thousand men who would raise its standard by following in his footsteps with the same energy, spirit and devotion to its cause.

E D I T O R I A L

OUR RESPONSIBILITY TO "OUR BOYS"

On this page the editor expresses his individual opinion with full cognizance that it may be shared by few and criticized by many.

A GREAT deal is heard and said these days concerning the obligation that we, who are left in civilian life, owe to those who have been called to the service of their country. That we have such an obligation is undeniable but there is some confusion in the minds of many concerning the scope of this responsibility.

Now, it would seem that, after acknowledging the need for diligent effort in the prosecution of the war, one of the best ways of determining what our boys expect of us is to ask them and not accept unchallenged the opinions of those who pretend to know all the answers without recourse to such a simple experiment. Demagogues and political spellbinders are just as plentiful in time of war as in time of peace and the phrases "because of the war", "you owe it to your Country", etc., fall just as easily from their lips as any other. We must, however, not let such phrases replace sound thinking and action since similar appeals in other language is the means by which totalitarianism developed in Axis Europe. We have today a great number of visionary planners on the American scene who, sensing the lowered mass resistance to change always occasioned by war, see a golden opportunity of reorganizing everything in accordance with their own theories and dreams. Anyone who even timidly suggests that some few things in our American life are quite satisfactory is immediately branded by them as a reactionary, a conservative, a Tory or one of those responsible for the war. Now, no sane person believes that all change is undesirable but, nevertheless, a change does not, *ipso facto,* mean progress.

Our boys in the service would tell us this—If you would discharge your responsibilities to us, protect our American ideals, traditions, freedom and way of life. It is this for which we are fighting, not an untested and untried plan that we know not of. When we

come home let it be home with all the things that we dream of having again, be they good or bad.

This it would seem is one of our major responsibilities—to so guard and protect America and its institutions that when our boys come home they can with a minimum of confusion pick up the thread of civilian life where they left it. If we so change and distort it that all they knew before is unrecognizable then we shall have a disillusioned and embittered legion to whom we must answer.

If radical change is unavoidable then it should at least be deferred until those, who have a foremost right in such decisions, are again in position to make their opinions and wishes known. Any other course of action is unfair, undemocratic and in contravention of our loudly spoken loyalty to our men and women in the service. They are fighting to protect and conserve America and not in defense of some distilled ferment whose inoculum is not of their own choosing.

L. F. Tice.

EFFECT OF INTRODUCING THE CARBOXYL GROUP INTO THE PHENOL MOLECULE ON TOXICITY TO GOLDFISH

By W. A. Gersdorff, M. Sc.*

THE investigation of the quantitative effect of changes in chemical structure on the toxicity of compounds was continued with a study of the monohydroxybenzoic acids ($HO.C_6H_4.COOH$). The same methods were used, with the goldfish *Carassius auratus* as the test animal. Tests were also made with phenol, the compound usually used as a standard of comparison for phenolic compounds, and with benzoic acid because of its close relationship to the hydroxy compounds.

Only chemically pure samples were used. The phenol was from freshly distilled stock; its boiling point was 182° C. The other samples had the following melting points: Benzoic acid 121°, o-hydroxybenzoic acid (salicylic acid) 158°, the meta isomer 201°, and the para isomer 215° C.

Experimental Procedure

The method of study was essentially the same as that previously described (1). Goldfish of a single lot and weighing between 2 and 4 grams each were used, and a constant temperature of 27.0° ± 0.2° C. was maintained. Measurements were made of the survival time in a series of concentrations of each compound.

For convenience stock solutions of the substances were made from which aliquot portions could be taken to prepare the test solutions. Because of the higher degree of solubility, ethyl alcohol (95%) was used instead of acetone as the solvent for making the stock solutions of the acids, and their concentrations were so arranged that the alcohol in the test solutions in no case exceeded 1.5 cc. per liter. Alcohol of this concentration has no apparent effect on goldfish of this size. All the substances formed clear solutions at the concentrations required. The stock solution of phenol was prepared with distilled water.

*Contribution from the Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture.

Experimental Results

The measurements made are assembled in table 1. A graphical comparison of the toxicity of the substances as expressed by these

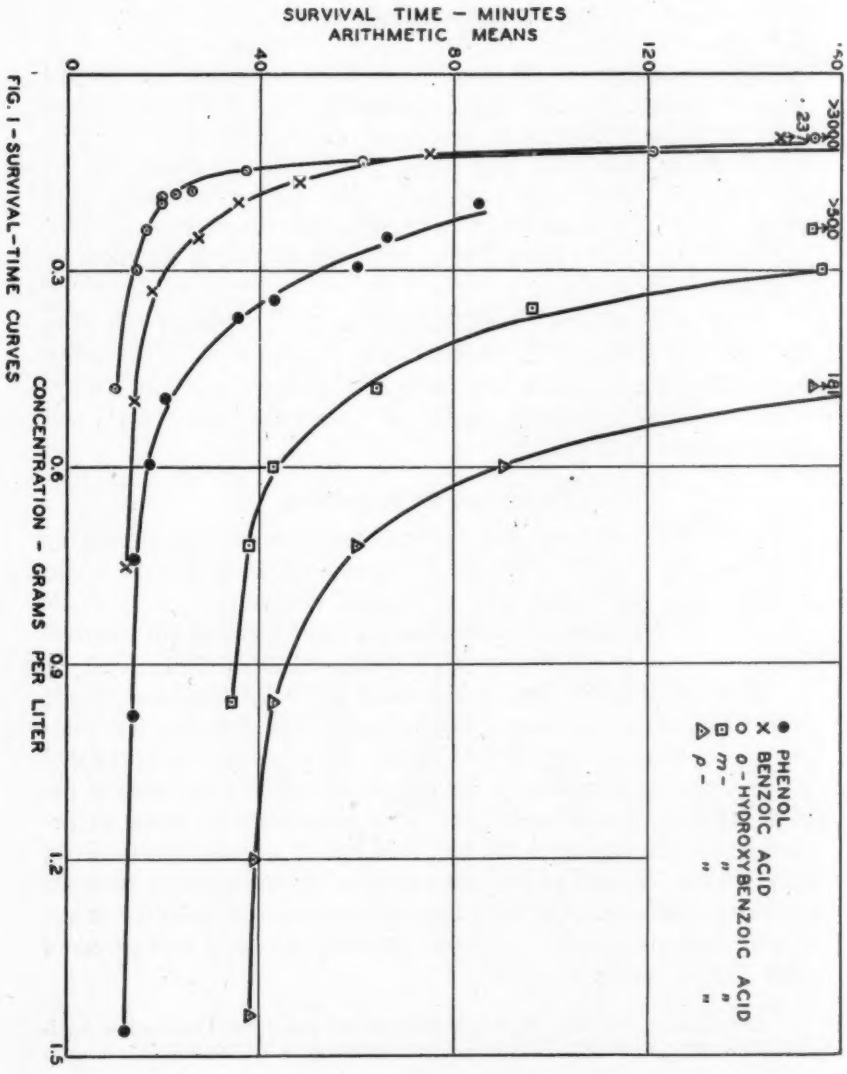


FIGURE 1.—SURVIVAL-TIME CURVES.

data is afforded by the survival-time and velocity-of-fatality curves in figures 1 and 2. Since a statistical method is to be used for determining the comparative toxicity values and this method considers variation of arithmetic means only, the latter are used in the graphs

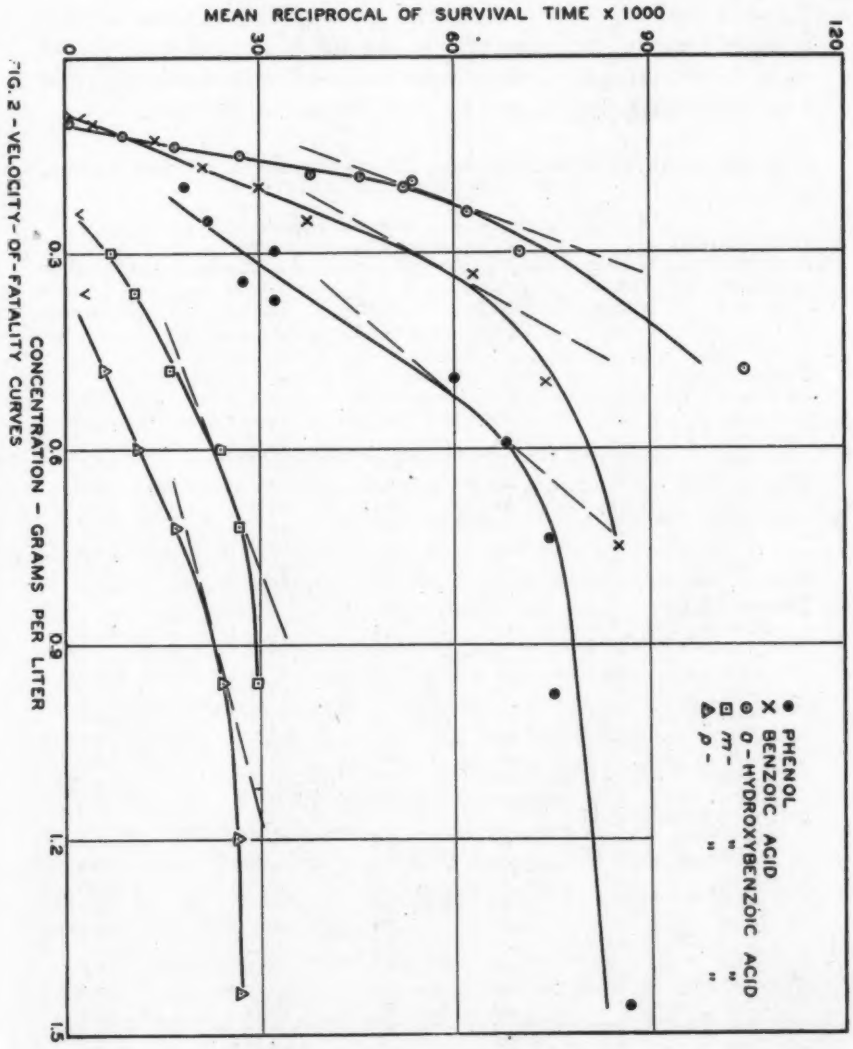


FIGURE 2.—VELOCITY-OF-FATALITY CURVES.

instead of the geometric means as in previous studies with phenolic compounds. Also, since this treatment of results reports standard errors, for the sake of uniformity the measure of variation of the mean survival times reported in table 1 is the standard error instead of the probable error as determined before. Such treatment destroys the reciprocal relationship of the two types of curves, since with the arithmetic means the reciprocal of the mean survival time is not equal to the mean of the reciprocals and intermediate points on one may not properly be obtained by interpolation on the other.

TABLE 1.—TOXICITY OF BENZOIC ACID, HYDROXYBENZOIC ACIDS, AND PHENOL TO GOLDFISH AT 27.0° ± 0.2° C.

Compound and concentration Grams per liter	Fishes used Number	Mean length of fishes Millimeters	Mean weight of fishes [1] Grams	Survival time,[2] Arithmetic mean Minutes	Velocity of fatality $\frac{1000}{t}$ Mean
Phenol					
1.46	10	41	2.1	12 ± 1	86.7
.980	10	43	2.4	14 ± 1	75.0
.739	12	41	2.1	14 ± 1	74.5
.593	13	41	2.1	17 ± 2	67.7
.495	14	40	2.0	20 ± 3	59.8
.372	14	42	2.3	35 ± 4	32.2
.346	16	39	1.9	43 ± 3	27.3
.298	16	42	2.3	60 ± 16	32.3
.249	16	39	1.9	66 ± 9	22.0
.199	14	40	2.0	85 ± 21	18.6
Benzoic Acid					
0.750	7	41	2.1	12 ± 1	84.7
.500	16	44	2.6	14 ± 1	73.9
.333	13	41	2.1	17 ± 1	62.7
.250	16	45	2.8	27 ± 1	37.4
.200	17	42	2.3	36 ± 2	29.8
.167	11	42	2.3	48 ± 1	21.2
.125	16	44	2.6	75 ± 4	13.9
.100	12	42	2.3	237 ± 9	4.28
.090	11	44	2.6	> 450 [3, 4]	2.3-1.1
o-Hydroxybenzoic Acid					
0.480	9	40	2.0	10 ± 1	104.6
.300	11	43	2.4	14 ± 1	70.1
.240	14	43	2.4	16 ± 1	61.9
.200	10	43	2.4	19 ± 1	52.2
.190	10	44	2.6	20 ± 1	53.4
.185	11	41	2.1	22 ± 1	45.6
.180	2	44	2.6	26 ± 2	37.8
.150	12	42	2.3	37 ± 1	27.0
.136	11	41	2.1	61 ± 4	17.2
.120	12	44	2.6	121 ± 12	9.01
.100	14	[5]	[5]	[3, 4]	
.090	13	[5]	[5]	[4]	

m-Hydroxybenzoic Acid					
0.960	12	43	2.4	34 ± 1	29.6
.720	9	41	2.1	38 ± 2	26.8
.600	10	40	2.0	43 ± 2	23.9
.480	9	42	2.3	64 ± 3	16.0
.360	9	42	2.3	96 ± 5	10.7
.300	15	42 [5]	2.3 [5]	156 ± 15 [7, 4]	7.03
.240	10				
p-Hydroxybenzoic Acid					
1.44	10	42	2.3	38 ± 2	27.0
1.20	11	43	2.4	39 ± 2	26.6
.960	12	41	2.1	43 ± 2	24.1
.720	10	45	2.8	60 ± 3	17.0
.600	10	43	2.4	90 ± 4	11.2
.480	10	42	2.3	181 ± 20	6.10
.360	10	44 [5]	2.6 [5]	> 350 [8, 4]	< 3.08
.240	8				

[1] Estimated from length, which measurement excludes the caudal fin.
[2] The limits of error indicated are standard errors.
[3] 4 fishes died in 355 minutes; others as in footnote 4.
[4] No apparent toxic effect after 8 hours, although a slight coagulation of mucus.
[5] Fishes not measured but of the same approximate size.
[6] 1 fish died in 210 minutes; others not killed in 52 hours.
[7] 1 fish died in 300 minutes; others as in footnote 4.
[8] 6 fishes died in 268 minutes; 4 were slightly affected, but very active after 8 hours despite extensive coagulation and sloughing off of mucus.

Quantitative Comparison of Toxicity

The measure of relative toxicity was the same as that used in previous studies (2), the minimal product of the two variables concentration and survival time (c_m t_m), and was approximated from either the survival-time or the velocity-of-fatality curve. Although with the use of arithmetic means as given the values obtained by the two methods are not identical, they are usually quite close. The minimal products as determined by the first method are as follows: For p-hydroxybenzoic acid, 40.5 gram-minutes per liter (0.900 gram per liter × 45 minutes); for m-hydroxybenzoic acid, 26.2 (0.625 × 42); for phenol, 9.76 (0.610 × 16); for benzoic acid, 6.03 (0.335 × 18); and for o-hydroxybenzoic acid, 3.78 (0.210 × 18). For reasons discussed in a previous paper (3), the range of concentrations selected for statistical treatment is that delimited by the use of 140 per cent of these values as the maximal products of concentration and survival time.

To determine the values statistically and evaluate their sampling errors, linear regression of the reciprocal of survival time on log concentration is estimated for the above selected ranges by the method of least squares. The regression lines are drawn and the equations given in figure 3. The minimal products are given by

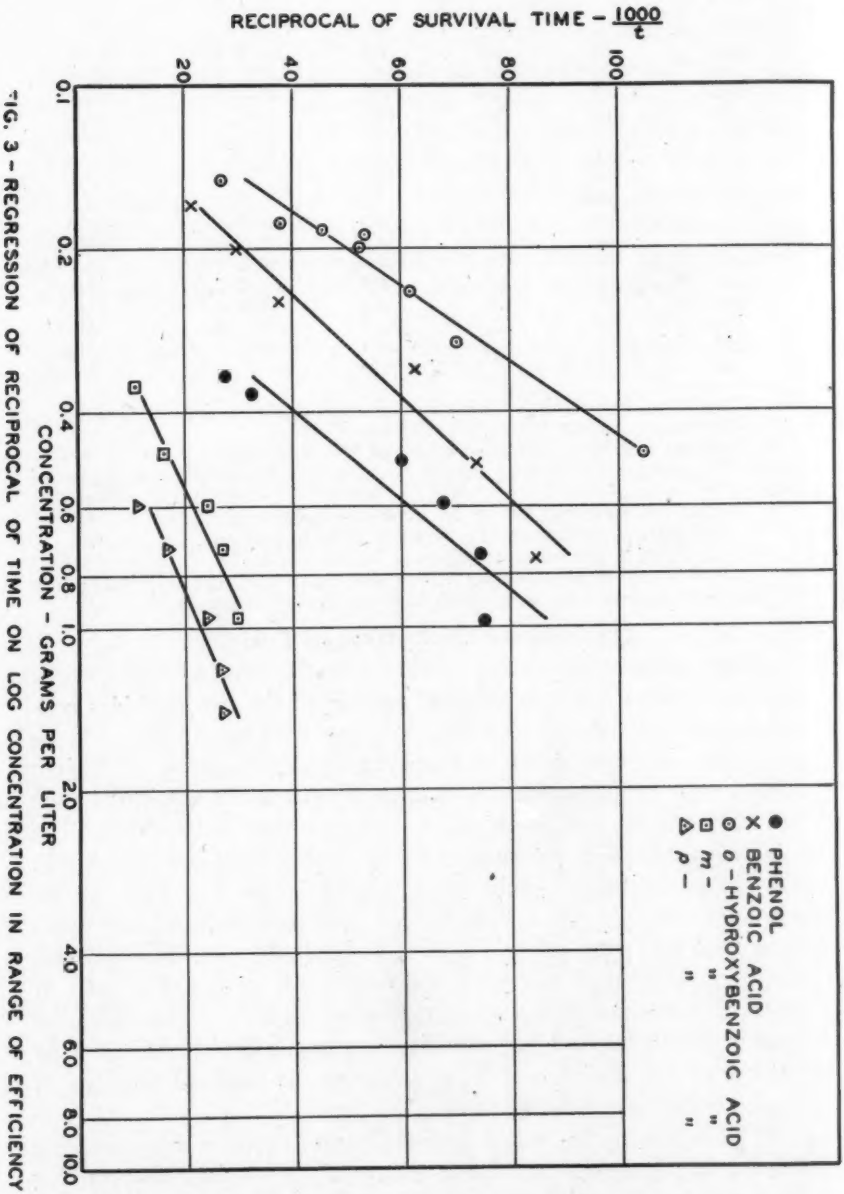


FIG. 3 - REGRESSION OF RECIPROCAL OF TIME ON LOG CONCENTRATION IN RANGE OF EFFICIENCY

FIGURE 3.—Regression of reciprocal of time on log concentration in range of efficiency. Regression equations, in which X = 100 times the concentration in grams per liter, and Y = 1,000 divided by the survival time in minutes:

Phenol:	$Y = -150.6 + 119.0 \log X$
Benzoic acid:	$Y = -107.1 + 105.9 \log X$
o-Hydroxybenzoic acid:	$Y = -135.9 + 142.7 \log X$
m-Hydroxybenzoic acid:	$Y = -60.22 + 46.06 \log X$
p-Hydroxybenzoic acid:	$Y = -62.30 + 42.41 \log X$

those tangents to the curves representing these equations which pass through the origin; their values are determined with the use of the fact that those tangents are the first differential coefficients of the curves. The sampling errors are evaluated in the manner described in a previous paper (3).

The data for comparison by this criterion are given in table 2.

TABLE 2.—RELATIVE TOXICITY OF THE HYDROXYBENZOIC ACIDS AND BENZOIC ACID AS COMPARED WITH PHENOL, WHEN MEASURED BY THE MINIMAL PRODUCT OF CONCENTRATION AND SURVIVAL TIME AT 27° C.

Compound	c_m Grams per liter	t_m Minutes	$c_m t_m$ Gram-minutes per liter	Toxicity $\frac{1}{c_m t_m}$ Liters per gram per minute	Relative toxicity
p-Hydroxybenzoic acid	0.800 ± 0.102	54.3 ± 5.7	43.44 ± 1.62	0.0230 ± 0.00086	0.223 ± 0.012
m-Hydroxybenzoic acid	0.552 ± 0.038	50.0 ± 3.0	27.58 ± 0.59	0.0363 ± 0.00078	0.352 ± 0.016
Phenol	0.501 ± 0.062	19.4 ± 2.2	9.71 ± 0.40	0.103 ± 0.0042	1.00
Benzoic acid	0.279 ± 0.022	21.7 ± 1.4	6.07 ± 0.19	0.165 ± 0.0051	1.60 ± 0.082
o-Hydroxybenzoic acid	0.244 ± 0.012	16.1 ± 0.82	3.93 ± 0.069	0.254 ± 0.0044	2.47 ± 0.110

Discussion

The toxicities of phenol, benzoic acid, and o-hydroxybenzoic acid as found are in the same order as their acidities. The last two are so strongly acid that their solutions cause the mucus covering the fish to coagulate and result in a general milkiness and finally a sloughing off of the coagulum. Moreover, this effect is very slight in the lowest concentrations, which are only slightly toxic. However, the relative toxicity cannot be ascribed solely to this chemical nature; m- and p-hydroxybenzoic acids, although less acid than the ortho isomer (4), are much more acid than phenol and yet considerably less toxic. In the solutions of these acids the coagulation of the mucus was still quite pronounced at the lowest concentration.

An immediately apparent effect of the introduction of the carboxyl group into the phenol molecule, or of the hydroxyl group into the benzoic acid molecule, is a considerable decrease in toxicity of the meta and para isomers. This decrease is clearly shown, not

only in the region of greatest efficiency as measured by this criterion, but also by the shifting of their toxicity curves with respect to each variable. The concentrations at which rapid increase in velocity of toxic action with increase in concentration begins and the survval times in which there is little decrease with increase in concentration are both considerably higher in these compounds.

With the other three compounds the pronounced differences in toxicity are apparent only in the regions of greatest acceleration of toxicity with increase in concentration. However, although o-hydroxybenzoic acid is more toxic than benzoic acid in these regions, the latter definitely begins to become toxic at slightly lower concentrations.

The toxicity of the para compound in relation to its isomers differs from that found in each group of monosubstituted isomeric phenols previously examined. Whether the substituent was the methyl group (5)—and this held true as well in the corresponding thiocresols in this case (6)—the nitro group (7), the chlorine, the bromine, or the iodine atom (8), the para compound was found to be the most toxic. With the carboxyl group as the substituent, the para compound has become the least toxic of the isomers. It seems probable that the acid radical has a greater effect than the other substituents on toxicity in relation to the hydroxyl radical.

Considered from the point of view of the hydroxyl radical being introduced into the benzoic acid molecule, the effects on toxicity are similar but of different degree.

Mazzetti (9) found these three isomers to have the same order in their bactericidal power. Hailer (10) found the bactericidal action of benzoic acid to be stronger than that of the meta and para hydroxy derivatives and that of the orthohydroxy derivative to be still stronger. Collett (11) found the toxicity of salicylic acid to *Paramecium* and *Euplotes* to be higher than that of benzoic acid.

Summary

A study was made of the toxicity of the three hydroxybenzoic acids, benzoic acid, and phenol with respect to concentration and survival time at 27° C. Goldfish of the same lot, weighing between 2 and 4 grams each, were used as the test animals.

The introduction of the carboxyl group into the phenol molecule affects toxicity with respect to both concentration and survival time

when it enters either the meta or the para position, and the effect is to decrease toxicity in both respects as well as to decrease it in respect to the acceleration of toxic action with increase in concentration. In the ortho position there is little, if any, definable effect on either of the parameters, but there is a decided effect in the region of greatest acceleration and that effect is an increase in toxicity.

According to the minimal product of concentration and survival time, which is a measure of toxicity in the range of most powerful action, the relative toxicity of the compounds as compared with phenol is determined statistically as follows: p-hydroxybenzoic acid 0.22, m-hydroxybenzoic acid 0.35, benzoic acid 1.6, and o-hydroxybenzoic acid 2.5.

LITERATURE CITED

(1) Gersdorff, W. A. 1930. A method for the study of toxicity using goldfish. *J. Am. Chem. Soc., 52,* 3440-3445.

(2) Gersdorff, W. A. (1935. A new criterion for the comparison of toxicity with respect to concentration and time. *J. Agr. Research, 50,* 881-891.

(3) Gersdorff, W. A. 1942. The effect of change of temperature on relative toxicity. *J. Agr. Research,* . In press.

(4) Abichandani, C. T., and Jatkar, S. K. K. 1938. Dissociation constants of o- m- and p-hydroxybenzoic acids, gallic acid, catechol, resorcinol, hydroquinone, pyrogallol and phloroglucinol. *Indian Inst. Sci. Jour., 21A,* 417-441.

(5) Gersdorff, W. A. 1937. Relative toxicity of the cresols as demonstrated in tests with *Carassius auratus. J. Agr. Research, 54,* 469-478.

(6) Gersdorff, W. A. 1938. Effect of the replacement of oxygen with sulphur in the cresol molecule on toxicity to goldfish. *Protoplasma, 31,* 199-206.

(7) Gersdorff, W. A. 1939. Effect of introduction of the nitro group into the phenol molecule on toxicity to goldfish. *J. Cell. Comp. Physiol., 14,* 61-71.

(8) Gersdorff, W. A., and Smith, L. E. 1940. Effect of introduction of the halogens into the phenol molecule on toxicity to goldfish. *Am. J. Pharm., 112,* 197-204, 316-322, 389-394.

(9) Mazzetti, G. 1927. Isomeria e potere battericida. Il potere battericida nei tre acidi ossibenzoici: ac. orto (ac. salicilico), ac. meta- e ac. paraossibenzoico. Atti accad. fisiocritici Siena, *Sez. med. fis.,* [10] *2,* 269-274.

(10) Hailer, E. 1938. Die Einwirkung keimtötender Stoffe auf Tuberkelbacillen des *Typus humanus* und *bovinus.* IV. Mitteilung. Versuche mit Säuren der aromatischen Reihe. *Z. Hyg. Infektionskrankh., 121,* 405-431.

(11) Collett, M. E. 1921. The toxicity of acids to infusoria. II: The role of molecule and of ions. *J. Exptl. Zoöl., 34,* 67-99.

FOOD IN 1943

By T. Swann Harding

A GREAT deal of unnecessary excitement has been lavished upon what certain newspapers got many of us to regard as a severe food crisis. Some of the more hysterical prophets of disaster predicted starvation before the end of 1943. Actually there never was any sound reason for such dire prophesies.

Our fundamental error was a failure to realize that a food crisis had been endemic for years; our second error was a failure to comprehend what total war means in terms of trade dislocation and lowered living standards. Rather too long after December 1941 we began to reorganize the food industry under government control. This process was bound to result temporarily in shortages of certain foods, black markets, and many other disagreeable sequellae.

For many years the myth of abundance has been a precious American illusion. Actually we never have had abundant food. As technology enabled us to produce sufficient food to provide all of us with adequate diets all the time, we spurned this gift of science. We sabotaged technology to reduce production for price maintenance. Food was produced, processed, and distributed at a price level which left about a third of our population almost altogether outside the market.

In those days, had all citizens ever had sufficient ration coupons in the form of dollar bills to enable them to purchase full diets, we should have had food shortages of stupendous magnitude. That could not occur under the price system, however. But when war came, different considerations were in order. Not only did expendable income in the hands of civilian consumers increase by leaps and bounds, but large groups of healthy young adults were placed in the armed forces, and it became necessary to see that everybody got sufficient food to maintain such health and morale as to win the war.

For the first time, then, we had to approach the problem of food in a technical manner and try to solve it functionally, with less thought than usual about profit margins and effective demand. At the same

time total war made tremendous demands upon labor and critical materials which farmers also needed to increase food production. Finally, the mere transition from a so-called free to a government-controlled economy was itself a difficult step to take at any time, much more so at war.

Necessarily a period of dislocation had to occur. This was the food crisis. As time goes on, however, we like other countries at total war, adjust our civilian standards of living to new levels, new types of workers begin to perform essential functions, and such allocations of materials are made as will prevent serious difficulties. In this sense the food crisis may be said to have passed with the appointment of Chester Davis as head of the War Food Administration.

Before that, however, the Department of Agriculture had devised many important and helpful measures to ease the tight food situation. During 1942 it effectively stepped up the production of essential foods needed by us, our armed forces, and our Allies, and did much to afford relief in farmer procurement of labor and machines.

It is not generally realized that 1942 was the sixth year in which farm production of the previous year had been topped, and that even 1937 was an all-out record year for farm production. But in 1941 and 1942 per capita consumption of foods among civilian Americans reached new heights never attained even in our periods of greatest prosperity. But even the greatly increased production of 1942 was insufficient to provide a liberal diet for all of us, though it will, carefully utilized, provide a moderate or at least a nutritionally adequate diet for all, if evenly distributed.

In 1943 we face the prospect of a diet about like that we had in 1935-36. That diet was not wholly satisfactory but, more evenly distributed and with less wastage clear down the line from field to kitchen, it should provide sufficient nutrition. We must focus our attention also upon the nutritive elements and not upon foods per se, for it is a question in 1943 of assembling from such foods as are available a diet that will be nutritively satisfactory, or at least not dangerously deficient.

Take meats as an example. At current prices it is estimated that the 1943 demand for meats would average about 70 pounds per

capita, dressed weight, in the lowest income group, and about 215 pounds per capita in the highest. Since we have a record number of people in higher income brackets that means that the normal total demand for meat in 1943 would exceed the supply that can be made available to civilian consumers by 5,000,000,000 pounds.

This discrepancy between effective demand and available supply makes rationing imperative. The present ration will tend to reduce consumption to about the level of 1935-36, or 126 pounds per capita. It is true that the people in the lowest income groups will not all be financially able to purchase as much meat as their coupons call for, but it is also true that the number of people in these groups is the lowest in years.

On the other hand people in upper income groups would normally buy a great deal more meat than the average which the ration will allow in 1943. What is true of meats is true also of edible fats and oils and of processed and canned foods. This puts great pressure upon cereals and a few other unrationed foods that are relatively plentiful and, in this way, some rationing leads inevitably to more of the same.

However, present reports indicate an increase of 4 percent in acreage for spring crops this year over last. Strenuous efforts have been made to get farmers to increase their production of such food crops as peanuts, sugar plants, dry beans, and potatoes. Assuming no changes in prospective plantings, a continuance of the present livestock-production trend, and average weather conditions, our 1943 output of food for human consumption should be 3 percent above 1942, and 30 percent larger than the yearly average between 1935 and 1939.

It is estimated that a million actual or potential farm workers will have left the farms between July 1942 and July 1943. But many replacements are already made by the return of experienced adult male workers to farm work as a result of a recent Selective Service regulation regarding deferment of farm workers of military age, and other measures taken to induce men over 38 to shift from nonessential to essential occupations. Farm workers are also being imported from Mexico and the Bahamas.

While scarcity of experienced, able-bodied farm laborers will present a problem throughout the war, it seems true to say that the crisis is past. Furthermore the amount of new farm machinery allocated to farmers in 1943 has been increased somewhat. It is still only 40 percent of that purchased in 1940, but 67 percent more repair parts than were sold in 1940 will be made available. The number of machines on farms at the beginning of 1943 was the largest ever, but their average age is greater than in previous years. Naturally demand exceeds supply.

Military and Lend-Lease needs will be allotted from 20 to 25 percent of our prospective 1943 food production. However, the remaining 75 to 80 percent is just as definitely allocated to civilians. Special units and personnel in the Food Distribution Administration of the War Food Administration act as claimants for civilian foods supplies, and expert advisers on their nutritive status—Dr. Russell M. Wilder of the Mayo Clinic among the latter.

The total share of production allotted to civilians in 1943 is approximately equal to average yearly production in the 1935-39 period, but the civilian per capita supply of food will be reduced below that level. Our civilian population this year is a million less than in the earlier period, due to growth of our armed forces, but since more of those left behind can buy adequate diets than ever before, demand will still exceed supply of many foods. The food crisis and the shortages were caused primarily by enhanced civilian purchasing power.

The average per capita consumption of all food fats and oils, including butter, was about 48 pounds in the average year between 1935 and 1939. It is estimated that consumers would purchase 55 pounds per capita in 1943 at current prices, but their actual supply will be held at about 46 pounds by rationing. Similarly, demand for all dairy products in 1943 would attain a milk-equivalent of some 855 pounds per capita; rationing will hold it to 770 pounds, actually below the 806-pound average of 1935-39.

The dairy products rationed are, of course, butter, canned milk and cheese. Of all rationed foods we shall have less than in 1942, and sometimes less than we had in the years before 1941. This includes meat, cheese, canned goods, processed foods, and the edible fats and oils. However, it will be possible for us to procure sufficient

fats and proteins to maintain health. While we shall not have as much meat and fish this year as last we shall have a great deal more poultry and at least as many eggs.

Though our supplies of cheese and butter will be limited our supply of fluid milk and cream should be a little larger this year than in 1942. Our total fats and oils, butter excluded, will be about the same as 1942, because margarine production will be greatly increased; lard will remain about as last year. We shall have somewhat less fresh fruits and vegetables, at least from commercial sources, for Victory Gardens should take up much of this slack. There will be more potatoes than in 1942 and as many dried beans and peas.

We shall have less sugar, coffee, tea, and cocoa. Our supplies of the important grains, wheat, rye, corn, oats, and barley, are ample. Our supply of rice will be at least a fifth less than in 1942. That, as of early May, is our 1943 food situation, and you must agree it adds up to a total a long way from starvation. We must substitute; we must do without many foods we should like to have; but we can be better nourished than the people in any other country at war.

Two other last-minute things should be said. One is that the spectacular floods of the midwest affected only about 1 per cent. of our arable acreage and will be largely replanted. Hence, the reduction of our food supply for this cause should be slight. The other is that rumors the War Food Administration intends to put us on a vegetarian or a Chinese diet are wrong. Livestock production will be curtailed as little as possible. It is true we must increase our production of highly nutritive vegetables and cereals though to help care for the artificial population increase thrust upon us by Lend-Lease.

In short, we must get used to the scarcities caused by total war. Labor, and machinery, as well as processing, storage, and transportation facilities are all affected by total war. There are dislocations all along the line. It takes some time to make workable readjustments. But American ingenuity is not baffled by that problem and the readjustments will be made.

MEDICINE IN THE CONFEDERATE ARMY

By George N. Malpass, Ph. C.

IN collecting stamps and envelopes of the Confederacy one occasionally runs across a letter of historical value, or of particular interest even to non-collectors. Such is frequently the case with the so-called Official and Semi-Official communications emanating from the various governmental offices.

The letter-cover here illustrated is from the collection of Mr. Van Dyk MacBride, of Newark, N. J., who called my attention to the interesting letter enclosed and loaned the cover for reproduction.

It will be seen that even letters from the War Department required stamps. The franking privilege was limited to the Post-Office Department, and only a half-dozen governmental officials were allowed to send mail post-free. By means of this careful control, plus other economies, the Confederate States Post-Office Department was self-sustaining during its entire life of four years. But that is another story, and is told accurately and entertainingly by August Dietz, of Richmond, Virginia, in his classic *Postal Service of the Confederate States of America.*

The official communication enclosed in the envelope was penned by a War Department clerk, and bears the signature of the Surgeon-General, Dr. Samuel Preston Moore. The letter reads as follows:

Confederate States of America,
Surgeon General's Office,
Richmond, Va., October 27th, 1862.

Sir

Your communication of the 20th inst has been received. In reply I have to state for your information that it was not intended to authorize the collection promiscuously of all the articles indigenous to the Mat Med (obviously Materia Medica) of the South, but simply to select a few of the more prominent and abundant of each of the classes possessing the different therapeutic virtues, in order that a sufficient quantity might be collected for general distribution, and that medical officers generally might become acquainted with, and accustomed to, the use of these special remedies. It was however requested from this office early in the Spring, that medical officers would contribute any valuable information concerning such Indigenous Remedies as it might be desirable to collect, and your information concerning the Richardsonia Scabra as a substitute for Ipecacuanha, if furnished then, would have proved much more acceptable. You are however authorized to have collected such quantity as may prove sufficient for its satisfactory trial in the Army. It is not thought desirable that the collection of the other articles proposed should be begun at this advanced stage of the season.

When a sufficient quantity of the various articles selected for collection have been procured, notification will be furnished in a Circular or Circulars from this office.

Very respectfully,
Yr. Obt. Servt.,
(signed) S. P. Moore
Surgeon General
C. S. Army.

To
Surg. F. I. B. Romer,
Mobile, Ala.

Apparently one of the most important problems of the Medical Department was the procurement of drugs. The Surgeon-General not only recognized this duty, but performed it in a most creditable manner, as will be described later.

Ipecac was even at that time a widely used and indispensable drug. Dr. Moore's remarks about the substitution of *Richardsonia Scabra* for the official species are of more than passing interest. Apparently the Confederate authorities were able to obtain this species overland, and thus did not have to depend on the uncertainties of running the Northern blockade to sources farther south.

According to the *United States Dispensatory XI (1858)*, which was the edition in use all during the War Between the States, the official species recognized was the *Cephaelis Ipecacuanha,* just as it is today. Several pages are devoted to a description of its properties and uses. Likewise, the non-official *Richardsonia Scabra* received a fair share of attention, much more than the mere half-dozen lines found in present day texts. In 1858 it was defined as follows:

> *"White Ipecac—Amylaceous Ipecac—Undulated Ipecac.* This variety was noticed in the work of Pison; but the vegetation which produced it was not satisfactorily ascertained till a recent date. Gomez, indeed, in the memoir which he published at Lisbon, A. D. 1801, gave a figure and description of the plant, but the memoir was not generally known, and botanists remained uncertain upon the subject. By the travels of M. St. Hilaire and Dr. Martius in Brazil, more precise information has been obtained; and the white ipecac is now confidently referred to different species of *Richardsonia,* the *Richardia* of Linneus, *Richardsonia Scabra,* or *R. Braziliensis* of Gomez, and *R. Emetica* are specially indicated by Martius. For the root usually called *white* ipecacuanha, Guibort has proposed the name of *undulated ipecacuanha,* derived from the peculiar character of the surface, which presents indentations or concavities on one side, corresponding with prominences or convexities on the other, so as to give a wavy appearance to the root. It differs little in size from the genuine; is of a whitish gray colour externally; and, when broken, presents a dull white farinaceous fracture, offering by the light of the sun, shining points, which are nothing more than small grains of fecula. Like the other varieties, it has a woody center. It is inodorous and insipid, and contains, according to Pelletier, a very large proportion of starch, with only 6% of impure *emetia* and 2% of fatty matter. Richard found only 3-5 parts of *emetia* in the hundred."

Later editions of the Dispensatory also state that the *Richardsonia Scabra* is indigenous to Brazil. However, if this was the species actually used by the Confederate army, it must have flourished in the Southern States or Mexico as well, to be available as a substitute for South American ipecac. With an emetine content of 3-5% it could well have been an efficient substitute.

Something should be said about the life and work of Samuel Preston Moore, efficient Surgeon-General of the Confederate army, and author of the foregoing letter. He was born in Charleston, S. C., in 1813, a lineal descendant of Dr. Mordecai Moore, who came to

America as the personal physician of Lord Baltimore. His early education was acquired in the schools of Charleston, and he was graduated in medicine at the Medical College of the State of South Carolina in 1834. The following year he was appointed assistant surgeon in the United States army, and at once entered a long period of service in the West, and later in Florida.

During the Mexican War, Dr. Moore was on duty chiefly along the Rio Grande. In 1849 he was detailed with troops to guard the transcontinental emigration of that wonderful year. It was in this same year that he attained his surgeoncy, with the rank of Major. Dr. Moore also served at Ft. Brown, Texas, Governor's Island, N. Y., and at West Point. In April, 1860 he was placed in charge of the medical purveying service at New Orleans. The coming of the War Between the States was to him, as to many other regular officers, the occasion for much distress of mind. He resigned from the service so as not to fight against his State, and entered the practice of medicine at Little Rock, Ark., apparently hoping that he need not fight against his country. Trained military surgeons were too few in the South, however, for one of so long service to remain unknown.

In June 1861 he was made Surgeon-General of the Confederate army, and at once set to work to organize a medical department. His task was most difficult. There was a shortage of doctors, as well as of drugs, supplies and hospitals. Owing to the general practice of organizations electing their own officers (including surgeons), many poorly qualified men were commissioned. General Moore established examining boards to weed out the unfit, and introduced, so far as possible, the organization and methods of the United States army.

As it became more and more difficult to obtain supplies from foreign countries (due to the Federal blockade), careful attention was directed to the preparation of drugs from indigenous plants, as described in the foregoing letter. Laboratories were established and depots located for distribution of the products thus manufactured. He also introduced the hut and one story pavilion hospital, which attained so great a vogue in both the Southern and Northern armies. Until World War I this was still the best model for army hospital use.

During the war he undertook two methods of keeping medical officers informed as to the progress of their profession. He organ-

ized in 1863, and was president of the *Association of Army and Navy Surgeons of the Confederate States,* and he encouraged publication of the *Confederate States Medical and Surgical Journal* (Jan. 1864-Feb. 1865). The association prompted meetings and discussions of medical subjects, and in general the extension of knowledge, much as does the present day medical society. The journal presented interesting articles in the way of case reports, original investigations, and reviews of foreign and Union books and journals. It was a useful publication, and its relative value was greatly enhanced by the absence of any other such publication in the South. He also prepared a *Manual of Military Surgery* for the forces in the field.

Probably he succeeded as well as any one could under the circumstances, but when the Union army entered Richmond, the records of his office were almost entirely destroyed by fire, as were most of the books and private papers of his family, so that there is very little documentary evidence of his work.

After the War, Moore remained in Richmond, not practicing medicine, but devoting much time to the furtherance of education and agriculture. He served as a member of the Richmond School Board and of the Virginia Agricultural Society. Dr. Moore lived quietly and in honor until his death, in 1889. As Surgeon-General he was regarded as strict and exacting, and as a severe disciplinarian, yet personally he seems to have been kind, mild, philanthropic, and modest and reserved in manner.

The efforts of Samuel Preston Moore did much to relieve the suffering soldiers of the Lost Cause, and we will do well to pay tribute, even at this late date, to the memory of this all-but-forgotten military surgeon, who was such a master of organization, and magician in the procurement of "ersatz" drugs.

NATIVES' RETURN

By Carter R. Bryan *

THE story of the migration of the Hevea tree, from which most of the world's crude rubber is obtained, from its native Amazonia to Africa and the Far East is well known. Before 1910 the world's supply of crude rubber was gathered in the vast South American wilderness in its liquid form of latex. At its peak, the wild rubber trade brought in from 60,000 to 70,000 tons per year.

But the cultivation of the rubber tree in British Malaya and the Netherlands Indies and the establishment of great plantations there brought the jungle trade almost to a close. In 1932 less than 1 per cent. of the crude rubber produced originated in the Western Hemisphere. By 1938 production in the other Americas had risen to about 2 per cent. of world production.

Today, the United States, the world's largest user of rubber, faces a materials problem of the first magnitude. We must have rubber for a thousand different needs and the Japanese have blocked most of our former sources of supply.

To meet these needs every possible source of crude rubber is being exploited by the Rubber Development Corporation, a subsidiary of the Reconstruction Finance Corporation, which expects to obtain 35,000 tons of natural rubber from Western Hemisphere sources during the current year. Another R. F. C. subsidiary, the Export-Import Bank, has approved credits for long-term projects for cultivation of rubber in the Americas. Once again, rubber collectors ply the rivers of Amazonia, tapping the wild Hevea and Castilloa; at long last, rubber production in the Americas is being organized. The native has returned, but there are others.

Kapok

Kapok, native to the West Indies and other parts of tropical America, has until recently reached its highest commercial production in Java, and less extensively in the Philippines, the Federated Malay States and Ceylon. With the exception of Ceylon all these producing areas are now in the hands of the Japanese. Consequently, the United States and the other United Nations must now look to the tropical Americas for supplies of this useful and strategic commodity.

Not a textile fiber, kapok does not compete with cotton for yarn or woven fabrics. It is resilient, buoyant, and water-resisting, and

*Chief Economist, American Republics Unit Bureau of Foreign and Domestic Commerce, United States Department of Commerce.

highly moisture-proof. Because of these qualities, it is valuable for stuffing mattresses, pillows, and life preservers. When compressed it is capable of supporting about thirty-six times its own weight in water. It is also employed as an insulating material and the property of lightness makes it particularly desirable for insulating airplanes against cold and sound and for equipping automobile trucks for refrigeration.

Grown under widely different conditions, it has developed numerous strains or varieties. In Latin America, Africa and the Asiatic tropics there are about 12 different types of trees of the bombax family which yield down similar and in some cases superior, to that of Java kapok.

Of the 7,800 long tons imported by the United States in 1940, about 90 per cent. came from the Netherlands Indies and about one-fourth of the balance came from the Philippines. It hardly need be said that today we must look entirely to American sources.

Increased demand for kapok has encouraged the gathering of wild kapok in Ecudor, Colombia, Venezuela, Panama, Brazil, Peru, Central America, Mexico and the Dominican Republic. An effort is also being made to cultivate kapok in Central America to supplement supplies formerly obtained from the Netherlands Indies. In 1940 about 325,000 seedlings were planted in private nurseries in Guatemala and approximately 195,000 in El Salvador.

The tree does not begin to produce fiber, however, until from five to seven years old, but with reasonable care may yield satisfactory crops for fifty years or longer.

Henequen and Sisal

Both sisal and henequen are native to Yucatan, Mexico, and their production in other parts of the world originated with plants brought from Yucatan. Henequen and sisal are used for the manufacture of wrapping twines, small ropes, and binder twine. If properly prepared, henequen is similar to sisal and can be used interchangeably with it for a number of products. For non-marine purposes, first grade sisal can be used in place of abaca.

Although Latin America, and more especially Mexico, had long been the foremost supplier of sisal and henequen to the United States, in recent years, from 1932 until the outbreak of the war, exports and production suffered a steady decline. Latin America production in 1932 totaled 156,584 tons; by 1938 this total had fallen to 77,576 tons. During the same period British East Africa production rose

from 85,047 tons to 146,800 tons, while smaller Netherlands East Indian and other African production rose similarly. By 1940 the Netherlands Indies had become the leading supplier to the United States. But with the outbreak of war between the United States and Japan this trend was reversed. Today Latin America production and exports are on the increase, and Mexico has regained her former position of foremost United States supplier.

Cassava

Cassava, first found in Brazil, where it is known as manioc or mandioca, is second most important of the world's root crops. Transplanted to Ceylon in 1786, and to India, by the Portuguese, long before that, today it grows in most tropical and subtropical regions and is extensively cultivated in West Africa and the Malayan Archipelago. About 2,000,000 acres in Java are planted with cassava, and at the time of the Japanese conquest the Netherlands Indies were the foremost exporting producers.

There are two species of cassava—the bitter, which contains prussic acid; and sweet, which can be eaten fresh. The root of the bitter cassava, which is the more important of the two in an economic sense, is highly poisonous until exposed to heat, and cannot therefore be eaten in a fresh condition, but prepared in a variety of ways in which heat is applied it is an excellent human food. The sweet cassava, on the other hand, is perfectly innocuous and is used as a table vegetable, but as such does not figure in foreign trade.

Shrubby perennials that grow as tall as 9 feet, cassavas have roots forming large tubers, some weighing up to 50 pounds. Although the average is less than half that size, one acre will produce 6 or more tons of roots, making cassava cultivation several times more profitable than the growing of wheat.

While in the tropics the tubers form one of the great food staples, cassava is not popular among northern peoples except as tapioca. Although U. S. imports of this starch in 1940 totaled 333,926,362 pounds and were valued at $6,508,915, only about 5 per cent. of these imports were supplied by Latin America.

Further, its uses are many—it serves as an excellent fodder for livestock, can be fermented into intoxicants, and has medicinal uses; its raw starch can be used as laundry starch, as sizing for paper and textiles, and is made into very superior dextrine used as postal mucilage and adhesives. Among the world's most wholesome foods, cassavas, by the thousands of tons, are consumed annually in the coun-

tries to the south of us, but, even there, they have nowhere the importance they have attained in Asia.

Cocoa

Cocoa is manufactured from the seed of the cacao tree, a native of tropical America. South Americans valued these seeds so highly that at the time of the Spanish invasion of that continent (1513-23) they found the beans being used as money. Their great dietary value was investigated by Benzoni in 1550, but their immense popularity both in the form of a beverage and of confections, may be spoken of as a significant feature of the nineteenth century. With the opening of the twentieth century cultivation began spreading into suitable areas throughout the world.

The cacao tree can be profitably cultivated only within 20 degrees north or south of the equator; it requires a mean shade temperature of 80° F., and an evenly distributed rainfall of 50 to 150 inches per year. Moreover, the tree requires a rich porous soil of considerable depth, and must be protected from the wind; a secluded valley provides the ideal environment. Despite these limitations world production in 1926 was more than triple that of 20 years before.

By 1936 the Americas' share of world production stood at 197,312 metric tons as compared with 524,010 tons produced in distant lands. World production in 1940 is estimated at about 750,000 tons of which 40 per cent. was produced in the Western Hemisphere.

Vanilla

Vanilla, a flavoring agent used largely in the manufacture of bakery products, confectionery, and perfumery, consists of the fermented and dried pods of several species of orchids. The great bulk of the commercial article is the produce of a native of southeastern Mexico, but now largely cultivated in Madagascar and Java. The plant has a long fleshy stem and attaches itself by aerial rootlets to trees; the roots also penetrate the soil. The fruit is a pod from 6 to 10 inches long, when mature and about half an inch in diameter. Marseille, until the outbreak of the war, had long been the chief center of the vanilla trade.

The best varieties of vanilla pods are of a very dark chocolate brown or nearly black color and are covered with a crystalline efflorescence which is taken as a criterion of quality.

Although the United States normally imports about four-fifths of its vanilla requirements from sources outside the Western Hem-

isphere, principally from France and her colonial possessions, the almost classic "I'll take vanilla" still can be heard at most United States soda fountains. This situation exists thanks largely to the production of synthetic vanillin, using oil of cloves, fir trees, and a coal tar product as the raw material. It should be noted, however, that Mexico, the original home of the vanilla orchid, in 1940 almost doubled the quantity of vanilla beans exported to the United States as against that in 1938. The value of vanilla bean imports from Mexico in 1940 more than trebled that of 1938. The United States in 1940 imported 1,309,854 pounds of vanilla beans valued at $4,913,133.

Capsicum Plants—Pimientos and Paprikas

The red peppers of the temperate zones, such as pimientos, paprikas, etc., are various species of *Capsicum*. These condiments are all natives of tropical America, where they were cultivated for condimental uses before the landing of Columbus, who took specimens back with him to Europe. In the South the fruits, green or ripe, are very popularly used as a condiment and for mixing with pickles. Some varieties are used for special purposes; for example, the small-fruited sorts, which are ground to make cayenne or red pepper, and the tabasco variety, which forms the basis of tabasco sauce.

The green peppers of northern markets are merely immature sweet red peppers. Both are used in preparing salads and by European and American cooks for making an inexpensive entree, the contents being removed and ground meat, rice, onion, and other flavoring put in their place.

Paprikas, produced in large quantities in Spain and Hungary, are large, long, and mild, Hungarian paprikas being somewhat sharper than Spanish. Spanish pimientos are used the world over in making cheese, in stuffing olives, and in garnishing meats, fish, and salads. In Spain and Hungary sweet peppers are ground into a powder or paprika and form a considerable business. Paprika is used in cooking and in making ketchups and salad dressings.

Besides their culinary condimental uses, capsicum is of medicinal value being used both internally and externally depending upon the ailment.

United States imports of red (cayenne) peppers, and chilies, originating in Japan, India, Italy, and Africa, totaled $226,992 in 1940, one year before Pearl Harbor. In the same year the United States imported 4,704,124 pounds of paprika, valued at $962,076, from Europe and North Africa. Principal suppliers were Hungary,

Spain, Bulgaria, Portugal, Algeria, and Morocco. Imports of pimientos packed in oil or brine, or otherwise preserved, all of which came from Italy, France, Portugal, or Spain totaled 84,352 pounds in 1940.

Today, almost all of our imports of cayenne peppers and chilies originate in tropical America, chifly Mexico. Production of pimientos for canning in the United States in 1942 increased 20 per cent. over the previous ten-year average. For paprika, production increased from less than 1,000,000 pounds to almost 4,000,000 pounds.

Quinine

The word quinine is derived from the Peruvian word *kina,* by the Spanish spelled *quina,* meaning bark.

Hundreds of years before the coming of the Spaniards the curative property of the bark of cinchona tree was known to the inhabitants of the northwestern portion of South America, but until 1640 it was practically unknown in Europe. It was not, however, until about 100 years ago that cinchona seeds were finally smuggled out of Peru and found their way to India, and subsequently to Ceylon, China and the East Indies.

Only in the Philippines and the Netherlands Indies, however, did cultivation prove successful. Plantings in the Philippines were inaugurated in 1926 by the Philippine Bureau of Forestry, and in 1936 a factory for the manufacture of totoquina was established. Production, however, was never large. At the time of their loss to the Japanese more than 42,000 acres of the Netherlands Indies were planted to cinchona trees, and about 23,000 pounds of bark were stripped annually. The Dutch monopoly, operated as a syndicate or combination of planters and three manufacturers, controlled 90 per cent. of the world's supply.

Today, the United States, fighting a war on two great tropical fronts and requiring almost unprecedented quantities of quinine, is, except for stock-piles acquired before Japan's attack, entirely dependent upon Latin American sources for its quinine needs. In 1937, Bolivia, Peru, Ecuador, and Colombia exported a total of 2,636,000 pounds of cinchona bark. Experts believe that under the stimulus of present needs this quantity can be more than doubled.

Cashews

So completely has India dominated the United States cashew nut market that in common parlance that country has often been referred to as the home of the cashew and to many it comes as some-

thing of a surprise to discover that the cashew is actually "a-local-boy-made-good."

In our nut imports cashews rank second only to the Brazil nut, and while our 1940 imports (totaling 28,939,561 pounds) exceeded our 1938 imports of this item by about 10 per cent., American hemisphere participation in the United States trade market in 1940 was about five times as great as that of 1938.

Besides producing a nut, the cashew tree's value as a producer of oil is probably greater than its worth as a producer of food. Oil from the cashew nut shell is an important and valuable import. Because of its high heat-resistance it is one of the best lubricants for magneto armatures in airplanes. Moreover, the oil can be used in composition, varnishes, insulating coatings, inks, and for termite-proofing of lumber. All of these uses suggest a great industrial future for this American native. United States imports of cashew nut shell oil in 1940 totaled 4,772,319 pounds and was valued at $206,864.

Peanuts

Originally a native of South America, the peanut and its cultivation has spread to all tropical and sub-tropical countries, and today peanuts are not "just peanuts" anywhere; in some countries they're food essentials, and in the United States they are big business and producers of strategic materials. Besides being sold "in the shell or salted" at peanut stands or as "butter" in grocery stores, peanuts are used for the manufacture of a vegetable oil and, shelled, yield from 42 to 50 per cent. oil by cold expression. A larger quantity, although of inferior quality, is obtained by the use of heat. The soft seeds make mechanical expression easy, and where a solvent is used a very pure oil is obtained. The oil is limpid, of pale yellow or straw color, and has a faint odor and pleasant flavor. It serves as an excellent substitute for olive oil and is used in various food and other vegetable oil preparations; further, the residue from which the oil has been pressed, peanut cake makes excellent cattle feed and if high-grade, well-blanched nuts are used the cake can be ground into flour for making bread.

Of total world production India and China each produce about one-third, but with the discovery of industrial and other new uses, some, the results of research of the late Dr. G. W. Carver, negro scientist, peanuts are coming forward as a leading southern United States crop.

Thus the natives have returned.

SELECTED ABSTRACTS

Free-Flowing Sterilized Sulphanilamide. H. Davis. *Pharm. J. 96,* 119 (1943). The production of a free-flowing powder of sterilized sulfanilamide is very difficult if the method of sterilizing by heating for one hour at 150° C. is followed. Although drying before sterilizing diminishes "caking" it does not give a powder suitable for use in an insufflator. A product has recently been introduced containing sulfanilamide plus 5 per cent. zinc oxide which cannot only be sterilized but it is claimed that the zinc oxide retards the rate of absorption of the sulfanilamide from the wound or cavity.

Since little appears to be known of the fate of the zinc oxide in the tissues the lowest possible concentration would appear desirable. The author reports that as little as 1 per cent. seems quite sufficient. Other drying agents were tried, namely, kaolin, calcium carbonate, bismuth subcarbonate, talc, and charcoal in concentrations of 5 per cent. and all were satisfactory. The addition of only 1 per cent. of either bismuth subcarbonate, calcium carbonate or charcoal gave fairly satisfactory results. Since bismuth has been so freely used in wound dressings it is quite likely that bismuth subcarbonate is the most desirable as an adjuvant in the production of a fine powder.

The Clinical Use of Penicillin. W. E. Herrell, D. H. Heiman and H. L. Williams. *Proc. Staff Meet. Mayo Clinic 17,* 609 (1943). Penicillin was first discovered by Fleming in 1929. In 1940 Chain, Florey, et al., reported on their work with this substance in inhibiting the growth of streptococci and staphylococci as well as anaerobic organisms associated with gas gangrene. It was also reported that this substance was practically non-toxic to test animals.

The present authors previously reported upon the antibacterial activity of penicillin using the tissue culture method and confirmed the data presented by the above workers.

A number of papers have been presented on the properties of penicillin which briefly are as follows: It is obtained from cultures of Penicillium notatum, it is highly soluble, easily destroyed by alterations in pH and it is hygroscopic. It is sensitive to oxidizing agents, less sensitive to reducing agents but heat, alcohols, and heavy metals

alter it considerably. Tissue degradation products and para-amino benzoic acid do not appear to inhibit its action and the material diffuses readily into all body tissues. It is excreted by the kidneys in part without evidence of renal toxicity.

Present evidence indicates that it should be most useful in the treatment of infections of Staphylococcus aureus, Streptococcus pyogenes, Diplococcus pneumoniæ, Neisseria gonorrheæ, Neisseria intracellularis and organisms associated with gas gangrene. It is the authors' opinion that at present penicillin is of greatest value by the continuous or nearly continuous drip intravenous technic. Four such cases have been observed with strikingly satisfactory results.

A complete case report is given of a patient suffering with severe facial and orbital cellulitis due to S. aureus and complicated by septicemia. Sulfadiazine, initially administered, was ineffective. Intravenous therapy with penicillin with no other treatment brought about rapid recovery.

A Comparison of Certain Drugs Used as Local Applications to Burns. Commander T. McKean Downs, Medical Corps. U. S. N. R. *U. S. Naval Med. Bull. 40,* 936 (1942). The treatment of about 35 patients suffering from burns resulting from the flash of bursting high explosives revealed the superiority of gentian violet in 2 per cent. solution over tannic acid jelly or spray. Some of the cases had received first aid treatment consisting of application of the tannic acid preparation, while others had received no treatment. In most of the cases the tannic acid jelly was removed, and after the wound had been cleaned the gentian violet solution was painted on. The area was left uncovered and exposed to the air. No infections developed, and the last patient was discharged to duty about 4 weeks after receiving the injury.

The eschar produced by tannic acid is thick and hard, and if it encircles an extremity may seriously impair circulation. Gentian violet is more analgesic than tannic acid, relieving the pain almost at once. In addition, it is antiseptic, it appears to promote epithelization, and it is harmless to the tissues. The eschar which it produces is thinner, softer, and much less subject to contraction than that formed by tannic acid.

The Treatment of Superficial Burns With Microcrystalline Sulfathiazole. Commander Camille M. Shaar, Medical Corps, U. S. N.; Lieut. Commander L. Kraeer Ferguson, Medical Corps, U. S. N. R.; and Lieut. (j. g.) Philip L. Nova, Medical Corps, U. S. N. *U. S. Naval Med. Bull. 40,* 954 (1942). Micro-crystals of sulfathiazole about one-twentieth the size of ordinary powder particles were prepared by crystallization over a high-frequency vibrator according to the method of Dr. Leslie A. Chambers, details of which are to be published elsewhere. Such micro-crystals possess the advantages of more rapid solubility than the usual particles and of freedom from clumping.

In burn cases the patient is given an adequate dose of morphine sulfate, after which the burned area is cleaned. By means of a powder insufflator a thin coating of micro-crystalline sufathiazole is applied, and the area is snugly bandaged. The dressings are moistened with isotonic saline solution two or three times daily and are changed every third day.

The above technic results in the quick relief of pain, the absence of the heavy secretion usually noted in burn cases, and rapid granulation and healing. It makes possible the early application of skin grafts.

Three case reports are presented.

The Detection of Methyl Alcohol in Ethyl Alcohol. C. W. Ballard and E. F. Hersant. *Quart. J. Pharm. & Pharmacol. 15,* 97 (1942). The British Pharmacopœia 1932 test for the presence of methyl alcohol in ethyl alcohol was found to present a difficulty in that it is impossible by the official method to prepare an absolutely colorless solution of magenta. A modification of the official method which was found satisfactory consisted of powdering the magenta, dissolving it in warm (not hot) water, and allowing the solution to stand 24 hours, with occasional shaking, before use. Under proper storage conditions the reagent retains high sensitivity for a month.

It was found that the temperature at which the test is carried out affects the development of the color.

Pure samples of ethyl alcohol were found to yield at least a slight color when tested, due partly to an incomplete inhibition of the reaction between acetaldehyde produced during oxidation and the reagent, and also to traces of formaldehyde produced by the oxida-

tion of ethyl alcohol. Hence, it was found advisable to use for comparison an auxiliary solution of methyl alcohol in a concentration equivalent to 500 p. p. m. of this compound in the original dehydrated alcohol. Such a limit is stated to be suitable for alcohol for pharmaceutical purposes.

The Rate of Absorption of Sulphonamides in Vitro and in Vivo After Local Application. A. T. Fuller F. Hawking and M. W. Partridge. *Quart. J. Pharm. & Pharmacol. 15,* 127 (1942). The rate of absorption of a sulfonamide from a preparation depends mainly upon the rate of the slowest of the following processes: (1) in the case of ointments, etc., sulfonamide molecules reach the interface between the preparation and wound-fluid either by solution in the aqueous phase of the ointment-base, or by passage of the solid particles through it; (2) the sulfonamide dissolves in the stationary layer of wound-fluid at the interface; (3) the sulfonamide is transported into the adjacent fluids and tissue by diffusion and by currents in the fluid.

In vitro studies of the absorption of sulfonamides from a compact mass of the preparation into a moving stream of water show that sulfanilamide is absorbed rapidly at first, but more slowly after 30 hours. Sulfapyridine and sulfadiazine are absorbed at low but constant rates; sulfathiazole occupies an intermediate position. Apparently the differing solubilities of the respective compounds are responsible for the results noted.

In vivo experiments on rabbits were performed by applying the sulfonamide preparation, corresponding to 0.6 Gm. of the drug, to a standardized surface wound and determining the amount excreted in the urine. Sulfanilamide produces a high initial concentration in the wound fluids, but this does not continue more than one or two days. Most of the excretion occurs during the first 24 hours. Sulfapyridine and sulfadiazine dissolve more slowly, producing a lower initial concentration, but one which lasts longer. The excretion of each of these drugs continues at an approximately steady rate for five days or more. Sulfathiazole occupies an intermediate position.

Since the therapeutic action of the sulfonamides is bacteriostatic rather than bactericidal, it is possible that the duration of sulfanilamide in a wound may be too brief to secure optimum results. It is suggested that a mixture of this drug with one of the less soluble ones, e. g., sulfathiazole, may be used advantageously.

The Effect of Various Media on the Rate of Absorption of Sulphanilamide. A. T. Fuller, F. Hawking and M. W. Partridge. *Quart. J. Pharm. & Pharmacol. 15,* 136 (1942). Studies were made of the effect upon the absorption of sulfanilamide ***in vitro*** and ***in vivo*** of incorporation of the drug in various oily and aqueous media consisting of oily bases, oil-in-water emulsions, water-in-oil emulsions, and glycero-gelatin bases. The general technic followed for the experiments was that described in a previous paper.

The incorporation of sulfanilamide in either an oily base or a water-in-oil emulsion delayed its absorption considerably both ***in vitro*** and ***in vivo***. Although a glycero-gelatin base did not greatly influence the absorption of the drug ***in vitro,*** it was found that ***in vivo*** the absorption was rapid. *In vitro* the use of an oil-in-water emulsion did not greatly influence absorption, but ***in vivo*** there was some delay if the preparation was embedded as a compact mass in deep wounds infected with streptococci, although absorption was rapid from thin films spread over surface wounds. The last observation was general for all types of preparations studied.

Neither the particle size of sulfanilamide nor preferential wetting of the drug with oil or with water had much influence on its absorption ***in vitro***. However, absorption of sulfanilamide from gauze impregnated with the drug by soaking in a boiling aqueous solution, followed by drying and autoclaving, occurred almost as rapidly ***in vivo*** as if the powdered drug alone had been applied. This form of medication is suggested for use as a field dressing.

SOLID EXTRACTS

Bringing Interesting Facts to Your Attention

A war-time bomb that will have peace-time use has been devised by scientists under the sponsorship of the United States Department of Agriculture. The missile is a mosquito bomb, made of black painted iron, and containing pyrethum extract as the chief agency of destruction. The pyrethrum extract is dissolved in a highly volatile solvent, which, when released by means of a device worked by the thumb, propels and atomizes the insecticide into a fog. It is as effective against house flies, stable flies and blow flies as it is against the malaria mosquito for which it is primarily intended.

AJP

Rotenone, another insecticide, used chiefly against crop pests, has been sought in many places for import into the United States, where it is sorely needed. Recently, 850 roots of the barbasco plant have been transplanted from Panama to Ecuador, where it is hoped that these roots will prosper and produce rotenone for North American use.

AJP

The habits of the American people in reference to the use of prepared dentifrices are interesting. Data gathered early this year indicate that 50.5 per cent. use pastes, 35 per cent. use powders and 5.1 per cent. use liquids. Of the remainder of the population, 2 per cent. make their own concoctions, chiefly salt and soda, while only 7.4 per cent. neglect their teeth entirely.

AJP

A recently-come-popular term in our literature is "geriatrics", which is the care of the aged from a nutritional and medical standpoint. At last we have more than the stilted admonition to grow old gracefully, and with a smile. Now we can learn with some degree of confidence just what to do when we grow old and how to grow older, in comfort.

We have heard much about the role of sulfanilamide in various therapeutic capacities, but we learn now of the use of this drug as a reagent. It seems that sulfanilamide produces a beautiful bright orange coloration with substances containing lignin, and, therefore, this reaction affords a simple means of determining the presence of lignin in paper, wood and various vegetable fibers.

AJP

The leading cause of death among the communicable diseases of childhood is whooping cough, against which now, quite happily, effective immunization is a reality. Routine use of such immunization steps promises to become a standard part of our preventive procedure in pediatrics. In a recent study, 83.3 per cent. of a number of children given prophylactic pertussis vaccination escaped the harrowing discomforts of the disease. 12.2 per cent. contracted light cases, 3.9 per cent. became subject to moderate cases, while only .6 per cent. were severely afflicted. In a control group, only 19.8 per cent. went "scot-free", while 21.2 per cent. had light cases, 47.4 per cent. had moderate cases, and 10.3 per cent. suffered from severe attacks.

AJP

In the perfection of civilian defense plans, which we hope we may never be forced to use, it is recommended that each hospital have on hand for immediate service one unit of plasma (that amount obtained from 500 cc. of blood) for every bed.

AJP

The American Institute of Public Opinion has gathered some interesting basic data on the common cold, that old bugbear that forces so much unwilling absenteeism. It found that February, as is to be expected, is the peak month for colds, with 18 per cent. of the population being affected. July is low, as is also to be expected, with an average of 5 per cent. The survey also confirmed health officials' contentions that colds come more frequently to those with low income, the findings being that lower income level groups had 60 per cent. more colds than those in higher brackets. People living on farms and in small towns had more colds than metropolitan dwellers, and the incidence of colds was highest in the States of Wisconsin, Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Kansas and Missouri.

BOOK REVIEW

Chemical Formulary. Edited by H. Bennett. Volume 6, 636 pages. Chemical Publishing Co., Inc., 26 Court Street, Brooklyn, N. Y.

This is the sixth volume of this collection of valuable, timely, practical commercial formulæ and recipes for making thousands of products in many fields of industry. This volume is not a revision or duplication of the preceding volumes but contains entirely different formulæ. The book should prove of value for military as well as civilian uses since it includes a chapter on substitutes for chemicals, metals, oils, rubber, wax, drugs, dyes, gums and minerals. A valuable chapter is one which lists chemicals and supplies and where they can be obtained.

The Chemical Formulary is of value as a source of formulæ of many, many types and should prove valuable to those who need such a general reference volume.

M. O. HOLLAND.

PHARMACIST

Unusual opportunity for a woman pharmacist to do diversified pharmaceutical research including product and package development, compounding and analysis. Permanent position with a long established, ethical pharmaceutical manufacturer, located in Eastern Pennsylvania. In reply, include information on education, experience, salary desired and recent snapshot (not returnable).

Box No. 53.

American Journal of Pharmacy

43rd Street and Kingsessing Avenue

PHILADELPHIA 4, PENNA.

THESE LABELS RARELY GO TOGETHER

but in the case of Parke-Davis Surgical Dressings they very well could. However, the "may be" in the warning label is understatement. The products are habit forming. Pharmacists who stock these items know how customers come back again and again for the high quality they find in Parke-Davis Gauze Bandages, Absorbent Cotton, Absorbent Gauze and Plasters. With thousands of medicine cabinets and first aid kits demanding attention today, it is more than ever worthwhile to devote prominent display space to . . .

PARKE, DAVIS & COMPANY
DETROIT, MICHIGAN

Parke-Davis Surgical Dressings

Sterile Shaker Packages Sulfanilamide, H.W.&D.

Our total output of 5 gram Sterile Shaker Packages of Crystalline Sulfanilamide, 30-80 mesh, developed by our research staff in cooperation with military authorities for the treatment of wounds in combat zones, has previously been requisitioned for military needs (totaling more than thirty million packages).

Completion of our new Sulfanilamide Division plant ahead of schedule and the resulting increased production has now made it possible for us to supply these packages for civilian medical use.

We will now accept orders for Sterile Shaker Packages of Crystalline Sulfanilamide.

The package should be sold only by or on the prescription of a physician.

Complete information and prices on request.

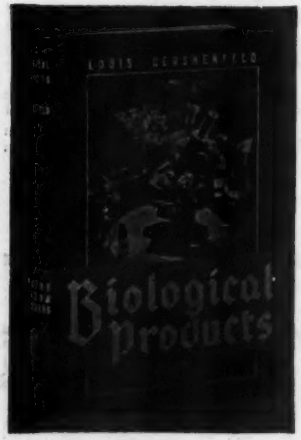
HYNSON, WESTCOTT & DUNNING, INC.

Baltimore, Maryland

"I WISH SOMEONE HAD GIVEN ME THIS BOOK WHEN I GRADUATED"

say pharmacists all over the nation.

This book supplies just the kind of information a pharmacist needs in order to have an intelligent understanding of biological products, their application in therapeutics and merchandising. If you want to boost your biological business get this book today.



BIOLOGICAL PRODUCTS

by Dr. Louis Gershenfeld, P.D., B.Sc., Ph.M.

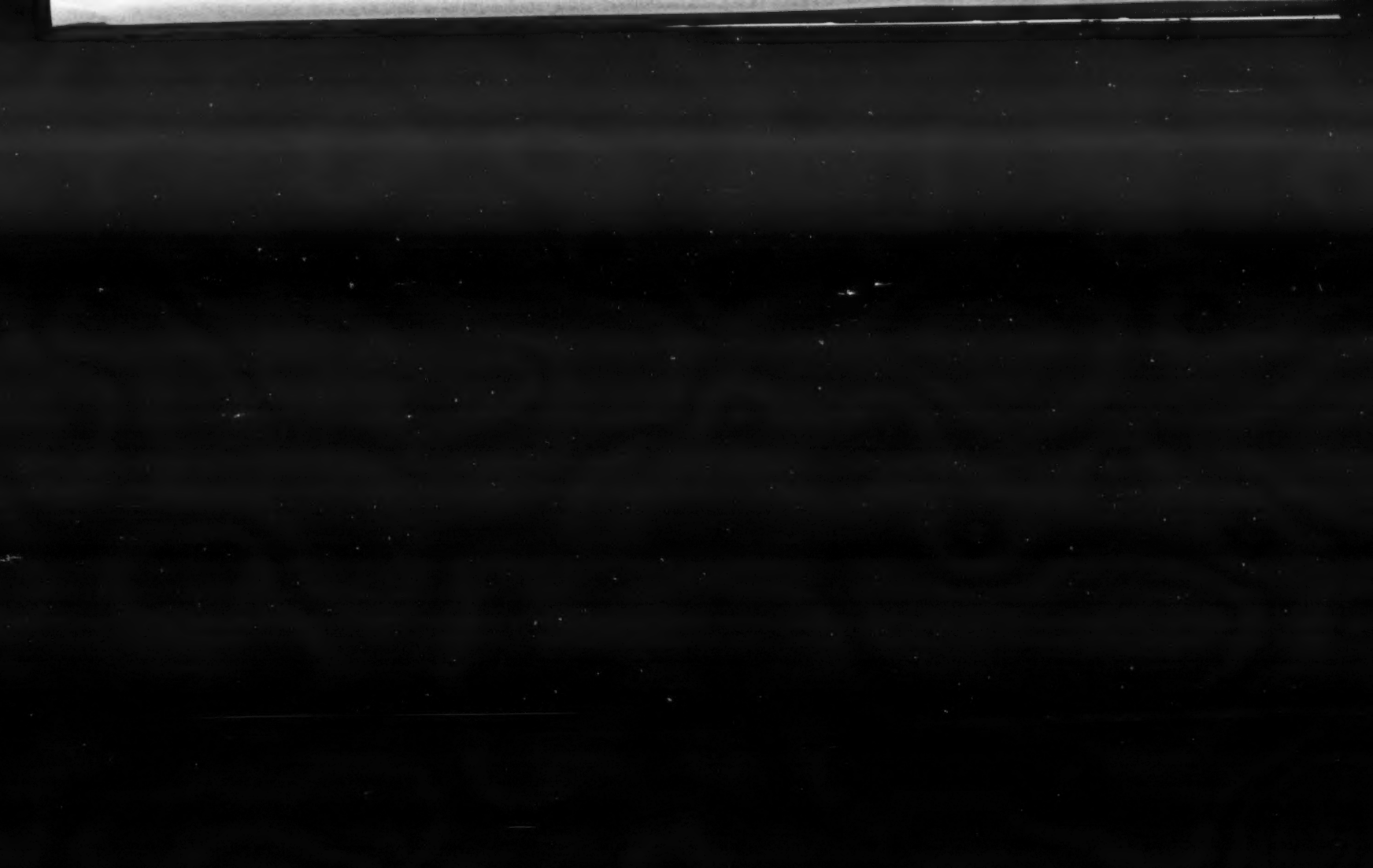
SOME OF THE SUBJECTS EMBRACED

Antitoxinum Diphthericum; Serum Sickness
Antitoxinum Tetanicum
Antitoxinum Scarlatinae Streptococcicum
Gangrene and Botulinus
Serum Antivenenosum, Venins, Venom, etc.
Antibacterial Serums
Serum Antimeningococcicum
Serum Antipneumococcicum
Antigens
Vaccinum Typhosum
Other Bacterial Vaccines, Plague, Cholera, etc.
Toxinum Diphthericum Detoxicatum, When to Immunize
Tetanus Toxoid
Tuberculinum Pristinum
Bacteriophage and Phagotherapy
Modified Viruses (Virus Vaccines)
Vaccinum Rabies
Yellow Fever
Poliomyelitis
Rickettsial Diseases of Man
Allergens and Sensitization Diseases

$4.00 plus 15c for postage and handling. ORDER NOW

ROMAINE PIERSON PUBLISHERS, INC.

99 NASSAU STREET NEW YORK, N. Y.



American Journal of Pharmacy

The American Journal of Pharmacy is the oldest continuously published scientific periodical of its kind in America, having been established by the Philadelphia College of Pharmacy in 1825. After the original issue there were three other preliminary numbers until 1829, when regular publication began. From then until 1852 four issues were published annually, with the single exception of 1847, when an additional number appeared. Six issues a year were printed from 1853 to 1870, at which time the Journal became a monthly publication.

Former Editors of the Journal have been: Daniel B. Smith, 1825-1828; Benjamin Ellis, 1829-1831; Robert E. Griffith, 1831-1836; Joseph Carson, 1836-1850; William Procter, Jr., 1850-1871; John M. Maisch, 1871-1893; Henry Trimble, 1893-1898; Henry Kraemer, 1898-1917; George M. Beringer, 1917-1921, and Ivor Griffith, 1921-1941.

Established and maintained as a record of the progress of pharmacy and the allied sciences, the Journal's contents and policies are governed by an Editor and a Committee on Publications elected by the members of the College.

Manuscripts should be sent to the Editor, who does not assume any responsibility in connection with the views or investigations of contributors of accepted manuscripts, other than to exercise general care in selection.

Contributors are allowed a reasonable number of copies of this Journal, free of charge, if applied for when the proof is returned.

Reprints, if desired, should be ordered when the proof is returned. The table below shows the *approximate* cost of reprints, the make-up of the pages to be identically the same as in the Journal. The actual cost may vary from the figures given, and will depend upon the amount of presswork, paper, binding, and other factors. Reprints containing half-tones may be expected to cost somewhat more than the rates given.

	2 pp.	4 pp.	8 pp.	16 pp.	Covers with Titles
50 copies.....	$3.50	$6.00	$10.50	$11.25	50 copies $5.00
100 "	4.25	7.00	14.00	15.00	100 " 6.50
250 "	5.25	9.00	18.75	20.00	250 " 10.25

SCIENCE IN WAR

☆ ☆ ☆

For twenty-one consecutive years, the Philadelphia College of Pharmacy and Science has offered to the general public a series of Popular Science talks delivered by members of the Faculty. These lectures have been designed especially to combine scientific accuracy and completeness with a minimum of technical terms, and the topics have always been timely.

In 1942, with our Country in arms, there was no more pertinent theme than that of the role played by SCIENCE IN WAR. Accordingly, each of the seven talks of the 1942 series dealt with one particular phase of the subject, and, while each lecture was independent of the others, there was enough continuity and sequence to enable the listeners to obtain a thorough mind-picture of this most important topic, leading to a better understanding of the conduct of war, both on the offense and the defense.

It is now the privilege of the College, through its publication, the American Journal of Pharmacy, and its Editor, Professor Linwood F. Tice, to present to the general public these talks in book form. The entire unit, which is Volume XIV of the Popular Science Lecture Series, will convey to the readers the same clear picture of warfare that was conveyed to the listeners who attended the lectures. The book comprises 100 pages, is amply illustrated, and is in clear, readable type. Paper-bound, it presents an appearance acceptable to any library, and is a fitting successor to the preceding volumes. The price of $1 is made possible by the assistance of a fund established in memory of the late Mr. Thomas D. Simpson, of Philadelphia.

☆ ☆ ☆

Order your copy now.

American Journal of Pharmacy

43rd Street, Kingsessing and Woodland Avenues

PHILADELPHIA 4, PENNSYLVANIA